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# Description of the last larval instar of *Aeshna* (*Hesperaeschna*) *cornigera planaltica* (Odonata: Aeshnidae)

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■ **ABSTRACT**. The last larval instar of *Aeshna (Hesperaeschna) cornigera planaltica* Calvert, 1952 (Odonata: Aeshnidae) is here described and compared to its closest allies and other known larvae of this genus from Argentina. It differs from them mainly in the prementum ratio width/ length, the shape of prothoracic processes and the relative length of the abdominal lateral spines.

**KEY WORDS.** Aeshnidae. *Aeshna cornigera planaltica*. Larval morphology. Taxonomy.

■ **RESUMEN. Descripción del último estadio larval de *Aeshna (Hesperaeschna) cornigera planaltica* (Odonata: Aeshnidae).** Se describe el último estadio larval de *Aeshna (Hesperaeschna) cornigera planaltica* Calvert, 1952 y se lo compara con los de *A. c. cornigera*, la "forma pantepúyica" de *A. cornigera* y las restantes larvas conocidas para el género de la Argentina. Difiere de ellas principalmente en la relación ancho/ largo del prementón, la forma de las apófisis protorácicas y la longitud relativa de las espinas abdominales laterales.

■ **PALABRAS CLAVE.** Aeshnidae. *Aeshna cornigera planaltica*. Morfología larval. Taxonomía

## INTRODUCTION

The cosmopolitan genus *Aeshna* Fabricius comprises almost 50 species. The subgenus *Hesperaeschna* Cockerell, with a neotropical distribution, is integrated by 17 species (Davies & Tobin, 1985). Presently there are known for this subgenus the larvae of *Aeshna (H.) californica* (Hagen) (Needham & Hart, 1901), *A. (H.) cornigera cornigera* Brauer (De Marmels, 1982), a particular form of *A. (H.) cornigera* known as "the pantepuyan form" of *A. (H.) c. planaltica* Calvert (De Marmels, 1992), *Aeshna (H.) peralta* Ris (Santos, 1966b; see also Muzón & Ellenrieder, 1997), *A. (H.) psilus* Calvert (Needham & Westfall, 1955; Calvert, 1956), *A. (H.) punctata* Martin (Santos,1966a) and *A.(H.) variegata* Fabricius (Muzón & von Ellenrieder, 1997).

In Argentina the genus is represented by three subgenera; *Hesperaeschna*, *Marmaraeschna* Calvert and *Neureclipa* Navás, with 12 species, and only the larvae of four of them have been described: *A. (H.) psilus* (Needham & Westfall, 1955; Calvert, 1956), *A. (H.) variegata*, *Aeshna (N.) bonariensis* Rambur (Abenante, 1978; Rodrigues Capítulo, 1980) and *A. (N.) diffinis* Rambur (Calvert, 1956).

For the southern members of *Aeshna (H.) cornigera*, Calvert (1952) described the subspecies *Aeshna c. planaltica* (based on specimens from Brazil, Ecuador, Perú, Paraguay, and Uruguay), considering that the distribution areas of both subspecies meets in Ecuador. In a posterior work Calvert (1956) mentioned a female from Mt. Roraima (Venezuela), that did not fit exactly with the description of *A. c. planaltica*, even though he placed it "doubtfully" in this subspecies. Posteriorly De Marmels (1989a; b) found more specimens with the same particular characters in the region of "Pantepuy", and he labelled them as the "pantepuyan form" of *A. c. planaltica*, without giving them a taxonomical status. The "pantepuyan form" distribution area is seemingly quite restricted, ranging only in

the hills of southern Venezuela (Mt. Roraima, Tapirapecó, and Cerro La Neblina).

De Marmels (1982) described the larva of *A. c. cornigera* and later (De Marmels, 1992), the one of the "pantepuyan form" of *A. c. planaltica*. Although De Marmels mentioned differences between the pantepuyan larvae and the typical of *A. c. planaltica*, he never gave a description of the latter.

In Argentina *Aeshna c. planaltica* is presently known from the provinces of Misiones, Jujuy, Salta, Tucumán, and Córdoba. The collection site of the here described larvae was a small temporary pool situated in the Yungas biogeographic Province (Amazonic Dominion of the Neotropical Region). This biogeographic province comprises a mountain rain-forest which extends along the oriental slope of the Andes, forming a narrow stripe from Venezuela to northwestern Argentina (Cabrera & Willink, 1973).

## MATERIAL AND METHODS

**Material examined. ARGENTINA. Salta,** temporary pool adjacent to National Route 9 (aprox. 5 km from the border with Jujuy prov.), 1300 m altitude, 24° 29.25′ S; 65° 17.82′ W, 03- IV- 1997, von Ellenrieder & Perez Goodwyn leg., last instar exuviae: 2 males, 3 females; last instar larvae: 4 males, 1 female. All specimens were reared in laboratory; the resulting exuviae and the dead larvae were fixed in 70% ethanol. The specimens are deposited in the Collection of Departamento Científico Entomología, Museo de La Plata, Argentina. Drawings were made with a net reticule.

Table I is based upon examination of reared specimens and the previous descriptions (Abenante, 1978; Calvert, 1956; De Marmels, 1982, 1992; Muzón & von Ellenrieder, 1997; Needham & Westfall, 1955; Rodrigues Capítulo,1980).

## RESULTS

### Description of the last larval instar.

**Head.** (Fig. 1) pale with diffuse dark pattern on dorsum, 1.5 times as wide as long. Occipital margin slightly concave, with 7 pilose patches on each side. Antennae 7-segmented, the third antennomere the longest. Labium reaching caudad posterior margin of second coxae; prementum (Fig. 2) basal two-thirds narrow, almost as wide as long (0.82), border of medial lobe with a fringe of setae and with two small tubercles, one on each side of median cleft, being both as long as the setae. Labial palp with a small infraapical tooth, inner margin serrated (*sensu* Corbet, 1953), with 19-25 denticles; movable hook 1.6 times as long as the inner margin. Mandibles (mandibular formula *sensu* Watson, 1956):

L 1234 y- a b k

R 1234 y aa′ b k

Left mandible (Figs. 5-6)

**A.** 1. Molar crest equal to or slightly shorter than the incisors
2. a > b > m
3. a sharply pointed, base of b broad, piramidal

**B.** 1. All the incisors tapered and the clefts between them deeper than in the right mandible
2. 3 > 4 > = 1
3. 3 and 4 basally fused

**C.** 1. y reduced, is only a rounded protrusion of the posterior margin
2. k small with broad base

Right mandible (Figs. 3-4)

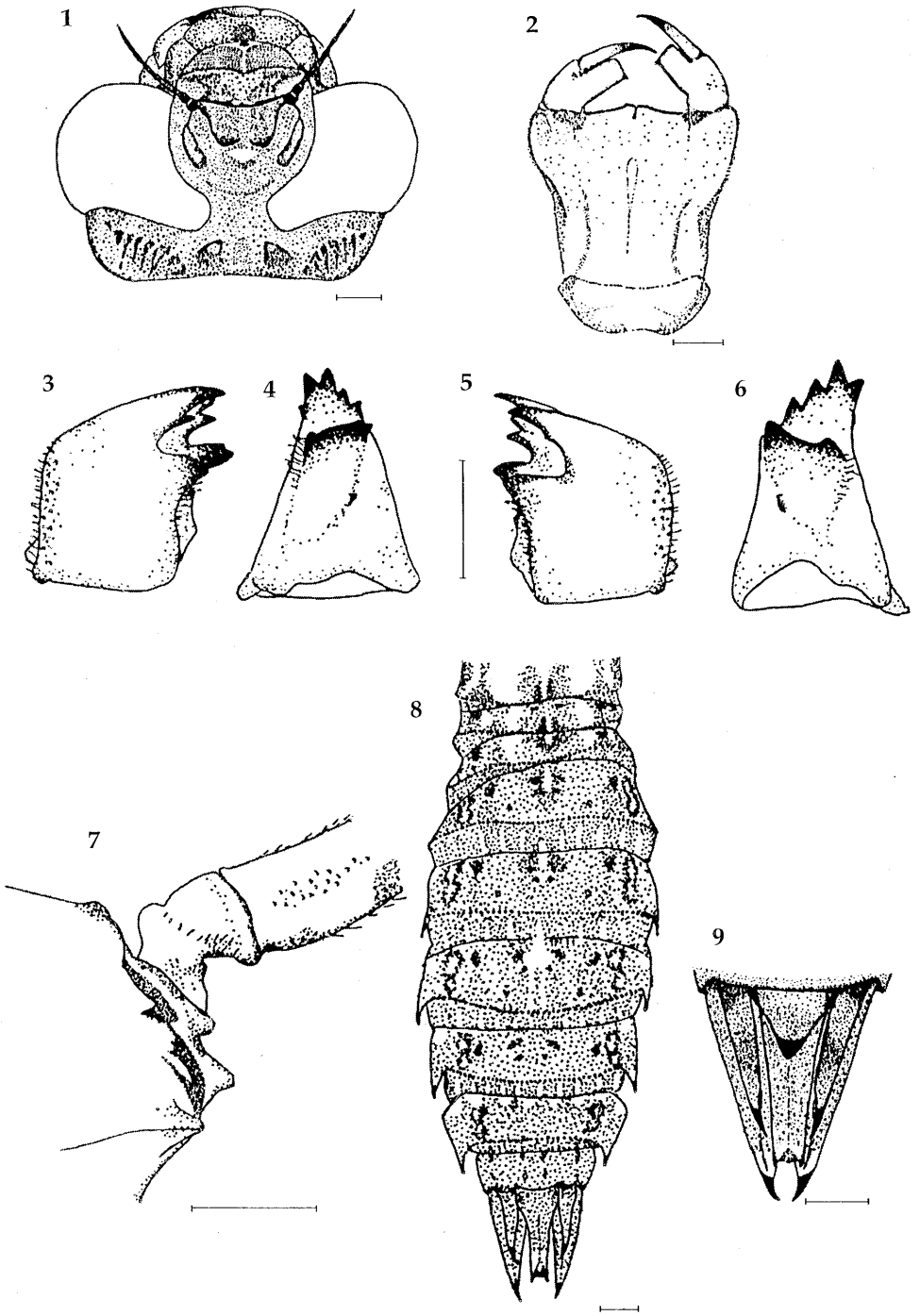
**A.** 1. Molar crest equal to or slighly shorter than the incisors
2. a > b > a′
3. a′ and b form either end of the crest, a pointed, base of b piramidal

**B.** 1. 1, 3, 4 tapered, 2 angulated
2. 3 > 4 > 1 > 2

**C.** 1. y well developed
2. k as in the left

**Thorax.** Prothoracic processes with blunt apex, base of the anterior one broader than the posterior one (Fig. 7); wing pads nearly parallel, the external reaching caudad the basal third of abdominal segment V; femora and tibiae with four dark annular bands.

**Abdomen.** Widest on segments VI-VII. Dorsal colour pattern as in Fig. 8. Ventrally covered with setae except for a lateral pale band on each side of all segments, segments V-VII and X bearing distally a transverse row of four diffuse brownish spots. Lateral spines present on segments VI-IX, the VIII the longest. Female gonapophyses reaching the posterior margin of segment IX. Cerci nearly as long as epiproct (0.92 - 1, average 0.98),




**Figs. 1-9.** *Aeshna(Hesperaeschna) cornigera planaltica*, last larval instar. 1, Head, dorsal view; 2, prementum, dorsal view; 3-4, right mandible: 3 posterior surface; 4 inner surface; 5-6, left mandible: 5 posterior surface; 6 inner surface; 7, prothoracic processes, dorsal view; 8, abdomen, dorsal view (female); 9, caudal appendages, dorsal view (male). (Scale = 1 mm)

epiproct 0.72 times as long as paraprocts, with a middorsal ridge and two apical short spines; male basal lamina with blunt tip, shorter than half the epiproct (0.42) (Fig. 9); cerci, epiproct and paraprocts pale, except for their tips and the apex of male basal lamina, which are dark reddish-brown.

**Measurements** (in mm, n = 10 ). Total length (without caudal appendages): 30.3 ± 1.95; head maximum width: 7.37 ± 1.95, head maximum length: 4.84 ± 0.4; prementum maximum length: 5.1 ± 0.45, prementum maximum width: 4.19 ± 0.12; palp movable hook: 1.57 ± 0.04; tibia I length: 4.13 ± 0.15, tibia II: 4.49 ± 0.15, tibia III: 5.44 ± 0.21; femur I length: 3.41 ± 0.07, femur II: 4.34 ± 0.25, femur III: 5.33 ± 0.2; internal wing pads length: 6.83 ± 0.27, external: 6.34 ± 0.21; abdominal segment VI maximum length: 2.2 ± 0.26, VII: 2.17 ± 0.22, VIII: 2 ± 0.23, IX: 1.67 ± 0.21, X: 0.97 ± 0.08; lateral spines (inner margin) on segment VI: 0.3 ± 0.07, VII: 0.59 ± 0.07, VIII: 0.78 ± 0.02, IX: 0.67; epiproct: 2.42 ± 0.13; cerci (external margin): 2.38 ± 0.1; paraprocts: 3.32 ± 0.24; inner gonapophyses (inner margin): 2.05 ± 0.05 (n = 4).

**Remarks.** The last instar larva of *Aeshna cornigera planaltica* is compared in Table I with those

**Table I.** Comparison between the last larval instar of *Aeshna (Hesperaeshna) cornigera planaltica*, its closest allies, and the other presently known larvae of the genus from Argentina (* Taken from the figures in the bibliography, # Examination of reared specimens).

| | *A. (H.)c. planaltica* | *A. (H.) c. cornigera* | *A. (H.) c. p. "pantepuyan"* | *A. (H.) psilus* | *A. (H.) variegata* | *A. (N.) bonariensis* | *A. (N.) diffinis* |
|---|---|---|---|---|---|---|---|
| **Head maximum Width** | 7.37 | 7.5 - 8.0 | 8.0 | 8.04 | 8.2 | 6.6 - 7.2 | 6.9 |
| **Labium reaches caudad** | coxae II | coxae II | surpases coxae II | ? | coxae II | coxae II # | coxae II # |
| **Width / length Prementum** | 0.82 | 0.75 # | 0.7 * | 0.83 | 0.82 | 0.66 | 0.9 |
| **Prothoracic processes size** | base ant.> posterior | base ant.> posterior | ? | base ant.< posterior * | base ant.≅ posterior | base post. ≥ anterior # | base post.≥ anterior # |
| **Apex protho. processes** | blunt | blunt | ? | blunt * | acute | blunt # | blunt # |
| **Femur III** | 5.33 | 5.55 | 6 | ? | 7.2 | 5.2 | 5.3 # |
| **Tibia III** | 5.44 | 5.9 | 6.7 | ? | 6.67 | 4.8 | 5.2 # |
| **Length spine VIII / seg. VIII** | 0.39 | 0.33 # | ? | ? | 0.29 | 0.56 | 0.4 |
| **Longest spine** | VIII | VIII | ? | IX | VIII | IX or IX & VIII | IX or IX & VIII |
| **Gonapophyses/ length seg. IX** | 1 | 1 | ? | ? | 1 | 0.8 | 0.88 |
| **Length cerci/ length epiproct** | 0.98 | 0.85 # | 0.98 * | 0.95 | 0.82 | 0.65 | 0.68 |
| **Apex epiproct basal lamina** | blunt | blunt | pointed | blunt * | blunt | blunt | blunt# |
| **Length basal lamina/ epiproct** | 0.42 | 0.38# | 0.45 * | 0.43 | 0.59 | 0.425 * | 0.51 |
| **Total length** | 33.2 | 33.8 | 34.5 | 30 | 36.6 | 28.8 | 31.8 |

of *A. c. cornigera*, the "pantepuyan form" of *A. c. planaltica*, and the other known larvae of the genus in Argentina.

## DISCUSSION

The prothoracic processes of the last larval instar of *A. c. planaltica* are quite different from those of *A. psilus, A. variegata, A. bonariensis*, and *A. diffinis*. Besides, in *A. variegata* the ratio length spine VIII/ length segment VIII is smaller, and in *A. psilus, A. bonariensis*, and *A. diffinis* the lateral spine of IXth segment is the longest (see Table I).

The larger ratio width / length of prementum allows to distinguish the last larval instar of *A. c. planaltica* from those of *A. c. cornigera* and the "pantepuyan form" of *A. c. planaltica*. Besides, *A. c. planaltica* differs from *A. c. cornigera* in the relative length of the cerci, and from the "pantepuyan form" of *A. cornigera* in the blunt apex of the basal lamina of male epiproct, the level that reaches caudad the labium, and its smaller size (see Table I). Not only the larva of *A. cornigera* from "Pantepuy" differs from the typical *A. c. planaltica*, but also the adult does. That was already noticed by Calvert (1956), and afterwards by De Marmels (1989a; b). Probably the "pantepuyan form" of *A. cornigera* is a new subspecies, and it would be requiered further study of the adults to establish its status.

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